

**CITY OF BOULDER
CITY COUNCIL AGENDA ITEM**

MEETING DATE: November 16, 2004

AGENDA TITLE: Consideration of a motion to accept the Comprehensive Flood and Stormwater Utility Master Plan, repeal the Comprehensive Drainage and Utility Master Plan adopted in 1989, affirm, restate and otherwise approve that, for the purposes of Section 11-5-3 B.R.C. 1981, that the following documents comprise the City's "master drainage plans" (1. Stormwater Collection System Master Plan (1984), and 2. the Major Drainageway Planning, Boulder and Adjacent County Drainageways – Phase B (1987)), and direct the city manager to continue to work towards updating the Stormwater Collection System Master Plan (1984) in the near future and continue working on updating plans for major drainageways over time with individual plans for drainageways such as Fourmile Canyon Creek, which is currently inprogress.

PRESENTER/S: Ned Williams, Director of Public Works for Utilities
Bob Harberg, Utilities Planning and Project Management Coordinator
Alan Taylor, Flood Program Manager
Donna Scott, Stormwater Quality Specialist

EXECUTIVE SUMMARY:

The purpose of this agenda item is to brief Council on the Comprehensive Flood and Stormwater Utility Master Plan (CFS) and to provide an opportunity for additional public comment and Council input. CFS was developed as the tool for reviewing and setting the direction for the city's Stormwater and Flood Management Utility. Staff recommends that Council confirm this direction by accepting the CFS Utility Master Plan by consideration of a motion.

The CFS sets the agenda for implementing programs and activities of the city's Stormwater and Flood Management Utility. Unlike other city master plans, CFS does not identify specific Capital Improvement Projects. Rather it provides guiding principles, program elements and action items as summarized in the Executive Summary (Attachment A).

Acceptance of the CFS will allow staff to take immediate action consistent with the following policies:

- Floodplain Mapping Updates – Implement a 10-year cycle for mapping updates and incorporate risk assessments.
- Flood Preparedness – Enhance flood monitoring and prediction and

- implement the findings from recent system evaluations.
- Property Acquisition and Floodplain Mitigation – Balance structural with non-structural alternatives to floodplain management. Construct flood mitigation projects as well as proceed with select floodplain property acquisitions.
- Sub-basin Management – Focus on reducing the impact of runoff by focusing on preventive measures to minimize pollution at the source and implementing “Best Management Practices.”

Certain policy recommendations made in the CFS require further public review and input as well as review and action from boards and Council before proceeding to action.

- Floodplain Regulations – Consider developing 500-year protection standards for critical facilities; consider “no adverse impact” approach to floodplain management.
- Water Quality Regulations – Update city codes to be compliant with, and where applicable, to exceed state and federal regulations. (Updated code changes are proposed in Agenda Item 3I.)

Some action items identified in the plan have been included for funding in the proposed 2005 Utility Fund submission (and are noted below):

- Public Education and Flood Insurance - Allocate \$125,000 annually to fund and staff a flood management program resource center (Action item - \$125,000 included in 2005 budget proposal).
- Water Quality - Ensure funding for continued participation in WASH. (WASH funding is included in the 2005 budget proposal.)
- One-time allocation of \$250,000 proposed in 2005 budget to update the Stormwater Collection System Master Plan.
- Ongoing funding of \$50,000/year to begin an inspection and maintenance program for stormwater quality and existing private on-site detention facilities.
- Ongoing funding of \$50,000/year for GIS tool development and system support.

The CFS is intended to replace the Comprehensive Drainage Utility Master Plan (CDUMP) that has been in effect since 1989. The CFS is an advisory document and will not constitute the "master drainage plan" for the purposes of § 11-5-3, B.R.C. 1981. The City's "master drainage plans" for the purposes of 11-5-3 are the *Stormwater Collection System Master Plan* (1984) and the *Major Drainageway Planning, Boulder and Adjacent County Drainageways – Phase B* (1987). The CFS calls for the *Stormwater Collection System Master Plan* to be updated in the near future. Plans for major drainageways will be updated over time with individual plans for drainageways such as Fourmile Canyon Creek (currently in progress.)

The CFS does not in and of itself establish any new funding or regulations. This will be accomplished as separate follow-up actions. Two of these follow-up actions are part of the current (Nov. 16, 2004) Council agenda including the 2005 budget and regulatory changes pertaining to connections and discharges into the stormwater collection system. Other follow-up actions will be submitted to Council for consideration at a later date. For example, the CFS recommends that analysis proceed with the development of a 500-year protection standard for critical facilities in line with federal guidance. If the CFS is accepted by City Council, this analysis would proceed and the results would be provided to various advisory boards and the public before returning to City Council for its final review and consideration.

FISCAL IMPACTS:

There are no fiscal impacts associated specifically with acceptance of the CFS. Recommendations that have fiscal impacts will be considered as part of the annual budget process. The CFS as presented is a "cost constrained" version. The financial approach recommended in the CFS considered evolving regulations, technology and development characteristics. This slower, methodical approach will allow for planning and adapting to these anticipated changes.

OTHER IMPACTS:

The CFS contains recommendations and action items for further consideration which may result in changes to city regulations. Analysis of any changes will include an assessment of possible options, ramifications, potential costs to property owners and an opportunity for public feedback.

BOARD AND COMMISSION FEEDBACK:

The Water Resources Advisory Board (WRAB) reviewed the CFS on May 17, 2004 and unanimously recommended approval of the plan and the associated capital improvements with the following comments and recommendations: (1) the path the city has chosen is a slower, more affordable path and there is a faster path that is a lot more expensive, and (2) there needs to be better coordination between departments on flood issues. (See Attachment B for the summary minutes.)

The Planning Board reviewed the CFS on Oct. 21, 2004 and unanimously recommended to City Council the acceptance of the plan. Planning Board review focused on the following questions:

1. Is the master plan consistent with the goals, policies and growth projections of the Boulder Valley Comprehensive Plan?
2. Does the Master Plan outline the BVCP Service Standards and a plan to meet them into the future?
3. Does the plan/update describe and assess capital needs and a funding plan for them?

The guiding principles of the CFS are consistent with the current goals and policies of the BVCP and the CFS provides a plan to implement these goals. Certain CFS related goals and policies will be reviewed as part of the 2005 BVCP major update process.

PUBLIC FEEDBACK:

A Community Review Group (CRG) was convened to review the analysis and recommendations of the plan through the CFS development process. The group was asked to raise issues or challenges to the information and draft recommendations that staff presented. Input from the CRG is described throughout the CFS document under the "Public Input" section for each recommended program elements.

An Independent Review Panel (IRP) of flood hazard experts met with staff and consultants to review CFS information and draft recommendations. The IRP comments and concerns are reflected throughout the CFS document. A letter from the panel to City Council outlining an overview of its work and recommendations is included in Attachment C.

Members of Plan Boulder County submitted comments regarding the CFS to the Water Resources Advisory Board in April 2004. Revisions to the CFS were made to address these comments, and responses to these comments are presented in Attachment D.

STAFF RECOMMENDATION:

Staff recommends that the City Council adopts a motion to:

1. Accept the Comprehensive Flood and Stormwater Utility Master Plan as presented;
2. Repeal the Comprehensive Drainage Utility Master Plan adopted in 1989;
3. Affirm, restate, and otherwise approve that, for the purposes of Section 11-5-3, B.R.C. 1981, that the following documents comprise the City's "master drainage plans":
 1. The Stormwater Collection System Master Plan (1984);
 2. The Major Drainageway Planning, Boulder and Adjacent County Drainageways – Phase B (1987).
4. Direct the city manager to continue to work towards updating the Stormwater Collection System Master Plan (1984) in the near future and continue working on updating plans for major drainageways over time with individual plans for drainageways such as Fourmile Canyon Creek which is currently in progress.

ANALYSIS:

The CFS attempts to balance programs and activities in the city's Stormwater and Flood Management Utility to satisfy current local interests, accommodate changing trends, philosophies, regulations and standards, ensure maximum effectiveness and cost efficiency, and meet evolving community goals and objectives. A summary of CFS

analyses including proposed guiding principles, program elements and action items is presented in the Executive Summary (Attachment A) and a broad overview is presented below.

Flood Management

The city of Boulder is extremely vulnerable to flash flooding due to its geographical location at the base of the Rocky Mountains. Flash flooding can occur with less than 30 minutes of warning. Recent flash floods along Colorado's Front Range include a 1997 flood in the city of Fort Collins that caused \$200 million in damage and claimed five lives. The flood was caused by a storm that dumped 14.5 inches of rain. Storms of this magnitude aren't uncommon along the Front Range; yet 100-year flooding in Boulder can occur with only three inches of rainfall. In 1976, the Big Thompson River flood destroyed over 300 houses and killed 300 people when 12-14 inches of rain fell in the Big Thompson Canyon along Highway 34. The canyon is very similar to the canyons just west of Boulder. Within the city of Boulder's 100-year floodplain, there are thousands of people and approximately 3,600 structures with an assessed valuation of almost \$1 billion. CFS includes specific program elements to address flood hazard including emphasis on floodplain mapping updates, risk assessments, flood preparedness, public education and flood insurance.

Over the last 15 years, the city has focused its flood management program efforts by removing structures from high hazard flood areas. Through these efforts 134 of 279 identified high hazard structures have been removed from the regulated high hazard flood zone. This was accomplished based on a combination of major drainageway improvements that narrowed the floodplain and/or the acquisition and physical removal of individual structures. A project that acquired and physically removed 13 multi-family structures (169 units) near Boulder High School is a major example of these efforts. This project also excavated the area north of Boulder Creek (now recreational/sports fields) to improve flood conveyance. CFS proposes to continue these efforts, balancing property acquisition and constructed flood mitigation projects.

Although current flood regulations require protection for flood levels up to 100-year event, there is concern that larger floods such as those experienced in Fort Collins and along the Big Thompson River will cause considerable damage and loss of life. The city currently regulates the 100-year conveyance and high hazard zones. Although floodplain maps identify a 500-year floodplain, this is only for information purposes, and there are currently no regulatory requirements. City Council discussed floodplain regulation issues at a Jan. 29, 2002 study session as documented below:

"Updated floodplain regulations to address redevelopment, critical facilities and storms exceeding 100-year levels were supported subject to the consideration of the results of additional analysis answering the following questions:

1. What would be defined as critical facilities?
2. What is the impact of the 500-year floodplain compared with the 100-year floodplain?

3. How would the regulations be revised to address redevelopment concerns?
4. What impacts would the revised floodplain regulations create?"

One of the action items recommended in the master plan is to proceed to develop **500-year protection standards for critical facilities** in line with federal guidance to ensure access to, use of and uninterrupted service for critical facilities such as: fire and police stations; water and sewer treatment plants; utility infrastructure for water, sewer, gas, electric and communications; schools; day care and senior care facilities; hospitals; major roads and bridges; and hazardous material storage. This action item will assess the appropriate level and type of regulation in the 500-year flood zone and will explore whether critical facilities should be held to a higher standard or if these uses should be excluded from the 500-year flood zone. (Note: several critical facilities have recently been constructed in the 500-year floodplain with 500-year flood protection including the Foothills Boulder Community Hospital and the Foothills Housing Development.)

Recent projections indicate that almost five percent of the parcels of land designated with redevelopment potential have greater than 50 percent of their land area within the high hazard or conveyance flood zones. Current city regulations would significantly restrict redevelopment of these parcels. Almost 20 percent of the parcels of land designated with redevelopment potential have greater than 50 percent of their land area within the 100-year floodplain. Current city regulations do not restrict redevelopment of these properties but require suitable flood protection measures. However, these properties would still be subject to flood damage from larger flood events. Many of these parcels which would be impacted by Boulder Creek flooding are located in the Boulder Valley Regional Center and the downtown business area. These issues will be further evaluated as part of the Flood Hazard Land Use Analysis, a joint effort between the Utilities Division and Long Range Planning staff.

The Utility has recently reorganized its activities to provide a point person (Flood Program Manager – Alan Taylor) to manage nonstructural flood management activities including floodplain mapping, risk assessments, floodplain regulations, public education, flood insurance and flood preparedness. Permitting of floodplain development will continue to be managed by Planning and Development Services.

Analyses of the flood management program including proposed guiding principles, program elements and action items are presented in Chapter 3.

Stormwater Quality

In 2001, in response to Federal Clean Water Act requirements, the Colorado Department of Public Health and Environment (CDPHE) expanded its regulations to include regulations for discharges from municipal storm sewer systems for cities with populations less than 100,000 and more than 10,000. The intent of this stormwater permit program is to reduce the amount of pollutants entering streams, lakes and rivers as a result of runoff from residential, commercial, municipal and industrial areas including construction sites. Stormwater permit compliance is based on implementing activities intended to reduce pollutant loading from urbanized areas. Changes to the Boulder

Revised Code (BRC) and Design and Construction Standards (DCS) to ensure that these city regulations are in compliance with our current permit requirements have been proposed by staff and will be considered by City Council on Nov. 16, 2004. CFS proposes a proactive approach to comply with both current and anticipated regulations including sub-basin management.

Water quality in Boulder Creek and its tributaries is a significant concern. The Colorado Department of Public Health and the Environment is considering listing Boulder Creek as an impaired water body for E. coli bacteria contamination. Elevated levels of E. coli have been found in Boulder Creek, west of the city to outside its eastern boundary and again in the segment below the confluence with Coal Creek. E. coli are bacteria found in the intestine of warm blooded animals and are associated with fecal waste. The source of the E. coli contamination in Boulder Creek is unknown. Suspected sources include wildlife (raccoons), domestic pets (dogs) and human waste products. CFS proposes a proactive approach to address this issue including stream enhancement.

Currently, Best Management Practices (BMPs) identified as options in the City's *Design and Construction Standards* (DCS) are geared more toward new development than toward redevelopment. Boulder is predominantly "built-out," and guidelines focused toward new development have limited applicability in denser, redeveloping areas such as the Boulder Valley Regional Center and the downtown business center. Therefore, more innovative solutions need to be applied. Examples of these BMPs include porous pavements, subsurface detention, vegetated landscape filters and hydrodynamic separator devices. CFS proposes that these BMPs be further investigated and considered.

Analyses of the stormwater quality program including proposed guiding principles, program elements and action items are presented in Chapter 4.

Stormwater Drainage

The existing Stormwater Collection System Master Plan provides the city of Boulder with a guide for minor storm (two-year frequency for residential areas and five-year frequency for commercial/ industrial areas) drainage related Capital Improvement Projects (CIP). This 20-year old plan should be updated to include drainage, detention, groundwater and stormwater quality issues. Land use has changed significantly, and the plan should consider planned development and redevelopment activities. Stormwater quality permitting requirements and BMPs should be further assessed and applied to individual sub-basins. CFS recommends that a Stormwater Management Plan be developed to address these issues.

The city has required on-site detention for new developments that increase imperviousness since the early 1970s. On-site detention storage is required for all developments other than individual single-family lots that are not part of a larger development. Most of these facilities are privately owned and maintained. The design of these facilities is reviewed by city staff at the time of application. The facilities are inspected and as-built drawings are now required to be submitted. However, there is currently no follow-up city inspection to assure these facilities are functioning as

originally intended. CFS proposes ongoing inspection of these facilities and further consideration of maintenance requirements.

Groundwater and sump systems create nuisance drainage in the public rights-of-way and potential hazards due to build-ups of slime and ice. Also, groundwater dewatering systems can affect local water wells and wetlands by lowering the groundwater table. Requirements for groundwater extraction and release are loosely defined in current city regulations. CFS proposes that these requirements be further defined.

Analyses of the stormwater drainage program including proposed guiding principles, program elements and action items are presented in Chapter 5.

Program Integration and Implementation

The Stormwater and Flood Management Utility is part of the city's Public Works Department. The organizational structure of the department provides both opportunities for and challenges to integrating various program interests and other multi-objectives. CFS points to a number of opportunities that will be used to integrate program activities by staff.

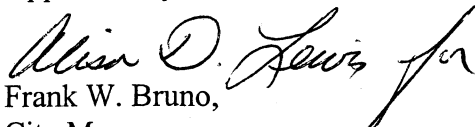
A significant opportunity for integration with other city objectives is the 2005 major update to the *Boulder Valley Comprehensive Plan* (2000). The update process will provide an opportunity to review land use and zoning designations from the perspective of flood hazard, water quality and drainage issues.

The Greenways Program is currently limited to Boulder Creek and six tributaries including Fourmile Canyon, Wonderland, Goose, Skunk, Bear Canyon and South Boulder Creeks. It is recommended that the Greenways program be expanded to all 15 of the city's major drainageways to provide for better integration of multiple objectives. Analyses of program integration and implementation issues are presented in the Chapter 6.

Alternative Proposals or Options

Although it is recommended the Council accept the CFS Utility Master Plan, Council may choose not to do so and provide direction as to specific chapters, issues or topics that require additional analysis and information.

Approved By:


Frank W. Bruno,
City Manager

ATTACHMENTS:

Attachment A: Comprehensive Flood and Stormwater Management Utility Master Plan Executive Summary

Attachment B: Summary Minutes of May 17, 2004 Water Resources Advisory Board Meeting

Attachment C: IRP Final Report from Flood Management Review Process dated April 2, 2004

Attachment D: PLAN Boulder County - Summary of Comments and Responses dated June 22, 2004

Attachment E: CFS Utility Master Plan Document dated October 2004



ATTACHMENT A

EXECUTIVE SUMMARY

INTRODUCTION

The Comprehensive Flood and Stormwater Utility Master Plan (CFS) provides a framework for evaluating, developing, and implementing various programs and activities in the within the scope of the available budget. The CFS replaces the 1989 Comprehensive Drainage Utility Master Plan (CDUMP).

The CFS is the result of the periodic need to update programs and activities to satisfy current local interests, accommodate changing trends, philosophies, regulations and standards, ensure maximum effectiveness and cost efficiency, and meet evolving community goals and objectives.

The Stormwater and Flood Management Utility (Utility) is responsible for the administration of the City's flood management, stormwater quality, and stormwater drainage programs. Its responsibilities include:

- ◆ Administration and Operations.
- ◆ Utility Rates and Finance.
- ◆ Program Development and Management.
- ◆ System Maintenance and Restoration.
- ◆ Flood and Stormwater Regulation and Compliance.

- ◆ System Master Planning and Design.
- ◆ Public Education and Community Outreach.
- ◆ Flood Prediction.
- ◆ Stormwater Quality Management.
- ◆ Emergency Preparedness and Day-to-Day Operations.
- ◆ Capital Improvements and Land Management.

The CFS Utility Plan's main objectives are to address: (1) flash flood hazards; (2) stormwater quality; (3) stormwater drainage; (4) program integration and implementation; and (5) financial considerations.

AREA DESCRIPTION

The Boulder Creek Watershed encompasses some 440 square miles and extends from the Continental Divide to the high plains east of the City. There are 15 major drainageways (or creeks) in Boulder, within which a total of 17 sub-basins have been delineated. The tributary drainageways all eventually feed to Boulder Creek north of the Valmont Reservoir.

The study area itself is nearly "built out" resulting in a highly urbanized drainage setting. The natural hazards related to stormwater and flood management are particularly complicated by the fact that

space is at a premium and that so many structures are within the floodplain.

PUBLIC PROCESS

A Community-Review Group (CRG) was used to provide "real-time" input to the analysis and draft recommendations for the CFS Master Plan. The CRG was created based on the key interests affected by the CFS.

The Independent Review Panel (IRP), a panel of flood hazard experts, also participated in the CFS development process.

The Water Resource Advisory Board (WRAB) met twice in 2003 and discussed key issues and the master plan process.

FLOOD MANAGEMENT

The Flood Management Program is responsible for all programs and activities related to local flooding and the floodplain.

The City of Boulder is extremely vulnerable to flash flooding due to its geographical location at the base of the Rocky Mountains. Within the City of Boulder's 100-year floodplain there are thousands of people and approximately 3,600 structures with an assessed valuation of almost \$1 billion.

The City continues to grow through a combination of new development and redevelopment activity. Within the floodplain, these activities pose additional potential for hazards due to flash floods.

Recent projections indicate that almost 5 percent of the parcels of land designated with redevelopment potential have greater than 50 percent of their land area within the high hazard or conveyance flood zones. Current City regulations would

significantly restrict redevelopment of these parcels. Almost 20 percent of the parcels of land designated with redevelopment potential have greater than 50 percent of their land area within the 100-year floodplain. Current City regulations do not restrict redevelopment of these properties but require suitable flood protection measures. However, these properties would still be subject to flood damage from larger flood events. Many of these parcels are located in the Boulder Valley Regional Center and the downtown business area which will be impacted by Boulder Creek flooding.

Boulder floodplain policies have not been updated since adoption of the CDUMP. As a result, our local floodplain management program has fallen behind the progression of national and regional trends and philosophies, and the nonstructural floodplain policy objectives outlined in the early years of our floodplain management program have never been fully realized.

Current Program Elements

Current flood management program elements include floodplain mapping, risk assessments, regulations, flood information and insurance, emergency preparedness, property acquisition, and flood mitigation capital improvements.

Guiding Principles

Using national and regional trends and philosophies, current and past local policies, and recommendations from the IRP and CRG as a backdrop for updating Boulder's flood management program, staff is recommending five guiding principles:

1. "Preserve Floodplains."
2. "Be Prepared for Floods."

3. "Help People Protect Themselves from Flood Hazards."
4. "Prevent Adverse Impacts and Unwise Uses in the Floodplain."
5. "Seek to Accommodate Floods, Not Control Them."

Recommended Flood Management Program Elements

Floodplain Mapping Studies Program

Floodplain mapping studies are essential in determining areas where life safety is threatened and damage to property is likely.

A 10-year update cycle coincides with the City's average timeline for updating new citywide topographic, planimetric, and aerial base mapping used for the study purposes.

In-depth analysis of floodplain mapping results can offer insights into the associated risks and levels of hazard inside the floodplain. The expanded hazard information is valuable for enhancing non-structural flood management program activities supported by the community.

Recommendations include:

- ◆ Adopt a 10-year update cycle for local floodplain mapping studies.
- ◆ Include floodplain risk assessments in all floodplain mapping updates.

Public Education and Flood Insurance

The guiding principle to "help people protect themselves from flood hazards" focuses on educating the public about flooding and providing information and resources the public may access to reduce

their own exposure to flooding. Given that Boulder is nearing "build-out," this approach allows the flood management program to reach out and benefit the community at large.

There has been a strong community interest in offering a greater balance of non-structural flood management program activities as part of the overall Stormwater and Flood Management Utility program. These recommendations will serve to help achieve this balance:

- ◆ Create a flood management program resource center and program manager.
- ◆ Allocate \$125,000 annual funding and staff resources for program support.
- ◆ Enhance the flood management Web site.
- ◆ Pursue an improved Community Rating System (CRS) rating given available resources.
- ◆ Research a local flood proofing program.

Flood Preparedness

The guiding principle to "be prepared for floods" focuses on floodplain emergency preparedness. Flood preparedness is a critical element in the City's floodplain management program, considering that more than 15 percent of the community is impacted by floodplains.

The more prepared a community can be with pre-flood preparedness, ongoing monitoring, effective warning systems, trained response, and post-flood recovery, the better chance the risks of flooding may be managed.

Recommendations include:

- ◆ Enhance coordination between the Office of Emergency Management and the City of Boulder by taking a more active role in emergency management.
- ◆ Continue to enhance flood monitoring and prediction, early warning, and multiple notification measures by implementing the findings in the University of Colorado and recent system evaluations.
- ◆ Update and improve the flood response and flood recovery plans to address actions by public officials and actions by residents and members of the public.
- ◆ Develop innovative user friendly information materials for the public and residents to follow in the event of a flood.

Floodplain Regulations

Floodplain regulations are land use regulations intended to regulate activities and development in the 100-year floodplain, conveyance zone (or floodway), and high hazard zone. They are designed to provide a mechanism to address life safety and property damage impacts by restricting certain activities and improvements in the floodplain.

The floodplain regulatory revisions include recommendations intended to better address issues of life safety and structural safety:

- ◆ Assess the adequacy of *life safety measures*.
- ◆ Address *floodplain mapping uncertainties*.

- ◆ Develop options for *mitigating new floodplain* encroachments.
- ◆ Develop *500-year protection standards for critical facilities*.
- ◆ Evaluate the adequacy of the *flood protection elevation for flood proofed structures*.
- ◆ Develop *hazard analysis standards*.
- ◆ Seek FEMA approval of engineered foundation standards for crawlspaces.
- ◆ Research limited residential flood-proofing options for structures located in lower-risk shallow flooding areas.
- ◆ Evaluate the Association of State Floodplain Managers "no adverse impact" approach to floodplain management.
- ◆ Seek FEMA and UDFCD acceptance of the City conveyance zone (floodway).
- ◆ Seek Boulder County/City of Boulder regulatory consistency.

Property Acquisition and Floodplain Mitigation

The floodplain risk assessments will provide a more detailed framework for evaluating floodplain management and/or mitigation alternatives.

The property acquisition and constructed flood mitigation program has been very successful over the years. However, modern community interests and national trends away from structural drainageway construction have raised questions regarding previous structurally oriented projects that involve significant costs and raise environmental and aesthetic issues. The following recommendations offer

approaches to balance structural and non-structural alternatives:

- ◆ Floodplain risk assessments, developed in conjunction with floodplain mapping updates, should be used to identify and quantify life safety and property damage risks to determine appropriate measures for property acquisition and floodplain mitigation.
- ◆ A balance of constructed flood mitigation projects (based on risks to life safety and of property damage) and acquisition of property (including removal of associated structures) should be applied to long-term floodplain management and preservation.
- ◆ Non-structural alternatives shall be considered and balanced with structural measures for floodplain planning and mitigation activities.

STORMWATER QUALITY

The City's Stormwater Quality Program is responsible for managing local activities to preserve, protect, and enhance water quality affecting Boulder's streams and drainages. The current program has four main components:

- ◆ Public Education
- ◆ Water Quality Monitoring
- ◆ Regulatory Compliance
- ◆ Source Control

In 2001, in response to Clean Water Act requirements, Colorado Department of Public Health and the Environment (CDPHE) expanded its regulations to include regulations for discharges from municipal storm sewer systems for cities with populations less than 100,000 and

more than 10,000. Stormwater permit compliance is based on implementation of stormwater management programs intended to reduce pollutant loading from urbanized areas.

Water quality in Boulder Creek and its tributaries is a significant concern. The CDPHE is considering listing Boulder Creek as an impaired water body for E. coli bacteria contamination.

Currently, Best Management Practices (BMPs) identified as options in the City's Design and Construction Standards (DCS) are geared more toward new development than toward re-development. Boulder is predominantly "built-out", and guidelines focused toward new development have limited applicability in denser, redeveloping areas such as the Boulder Valley Regional Center and the downtown business center. Therefore, more innovative solutions need to be applied. Examples of these BMPs include porous pavements, subsurface detention, vegetated landscape filters and hydrodynamic separator devices.

Current Program Elements

Current stormwater quality program elements include water quality regulations, sub-basin management and stream enhancement.

Guiding Principles

Recommended stormwater quality guiding principles, based on national trends and current local policies, include:

1. "Preserve Our Streams"
2. "Prevent Adverse Impacts from Stormwater"
3. "Protect and Enhance Our Stream Corridors"

Recommended Stormwater Quality Program Elements

Water Quality Regulations

Implementation of a common approach results in consistency throughout the Boulder Creek watershed and provides more comprehensive, regional protection of water quality.

Continued water quality monitoring of the main stem of Boulder Creek will provide information needed to evaluate the impact of existing and new regulatory requirements such as the Total Maximum Daily Limit (TMDL) and sediment/aquatic life standards.

Recommendations include:

- ◆ Update City codes and development standards to meet applicable federal and state regulations. Update City standards to exceed federal and state requirements where appropriate to meet local water quality protection needs.
- ◆ Ensure adequate funding for the continued participation in the WASH program and the City's individual requirements for compliance with the City's Stormwater Permit.
- ◆ Continue to pursue opportunities to collaborate with other communities to address water quality issues.
- ◆ Track upcoming regulatory changes to develop the most cost effective approach to compliance.
- ◆ Enhance water quality monitoring program to improve data analysis, program evaluation and compliance tracking.

Sub-basin Management

Sub-basin management focuses on reducing the impact of runoff by focusing on preventive measures to minimize pollution at the source. Recommendations include:

- ◆ Research BMPs oriented to redevelopment and existing development in highly urbanized areas such as the Boulder Valley Regional Center and the downtown business center and incorporate appropriate BMPs into City Ordinances and Standards.
- ◆ Integrate water quality objectives into the City master planning process, such as updates to the Boulder Valley Comprehensive Plan (BVCP) and the update to the Stormwater Management Plan.
- ◆ Examine the stormwater utility rate structure to promote innovative BMPs and investment in public regional BMPs.
- ◆ Develop incentive programs to promote BMPs in both residential landscapes and commercial development that are innovative and exceed City requirements.
- ◆ Explore the use of subsidies, public-private partnerships, and grant-funding to implement innovative urban BMPs. Consider special improvement districts for targeted areas, such as the Boulder Valley Regional Center and downtown business center.
- ◆ Increase the water quality benefits derived from the City's urban forest through support of the City's Urban Forest Program and tree planting programs for parks and other City owned properties. Consider updating regulations and standards to increase

tree planting requirements for new development and re-development projects.

- ◆ Integrate multiple objectives including water quality enhancement on City-owned land and in decisions regarding future property acquisition.
- ◆ Develop GIS tool to prioritize water quality improvement projects for sub-basins using data such as potential pollutant loading, land-use, impervious surface, groundwater recharge and other data, some of which has been developed in the *2000 Boulder Creek Watershed Study*.
- ◆ Update development and re-development regulations and standards to expand runoff reduction and water conservation requirements.

Stream Enhancement

Stream enhancement focuses on the stream corridor itself. Stable stream environments are necessary for fish and other aquatic species to survive. Riparian habitat provides a number of water quality and ecosystem functions.

Recommendations include:

- ◆ Protect and preserve the watershed's most critical and fragile areas – floodplains. Provide ample flood capacity and freeboard, allowing for increase in riparian vegetation and roughness. Integrate floodplains protection with stream channel enhancement through the major drainageway planning process.
- ◆ Expand the *Greenways Master Plan* principals to all tributaries beyond Boulder Creek and the six tributaries currently studied.

- ◆ Use balanced approaches to drainage solutions that provide multiple benefits, including the water quality/quantity benefits of preserving the stream corridor and its natural character.
- ◆ Avoid hydrologic disconnect between groundwater and surface water in stream channels.
- ◆ Implement sub-basin water quality management practices and projects in conjunction with Greenways project implementation.
- ◆ Update the *Greenways Design Guidelines* to include measures to stabilize channel erosion and sedimentation, support fish and other aquatic species movement, protect riparian habitat, and other measures to promote stream stability.

STORMWATER DRAINAGE

The City's stormwater collection system consists of a variety of storm sewers and open drainage ditches that collect water and divert the water to major drainageways.

Irrigation ditches collect stormwater in many places in the City. Depending on the amount of rainfall, stormwater flows may exceed the capacity of the ditch and spill from the ditch in an uncontrolled manner.

In the past, the 's emphasis has been to provide structural solutions, such as drainageways and storm sewer facilities, to resolve stormwater and flood management issues. Now, the overall guiding principles are in place to develop a balance of structural and non-structural solutions to these critical programs and activities.

Current Program Elements

Current stormwater drainage program elements include stormwater collection system and planning; design and construction standards; maintenance; detention and groundwater extraction and release.

Guiding Principles

Guiding principles for the stormwater drainage program component based on national trends and current local policies are proposed as follows:

1. Maintain and Preserve Existing and Natural Drainage Systems."
2. "Reduce and Manage Developed Runoff."
3. "Eliminate Drainage Problems and Nuisances."

Recommended Stormwater Drainage Program Elements

Stormwater Collection System and Planning

The existing Stormwater Collection System Master Plan provides the City of Boulder with a guide for minor storm (2-year frequency for residential areas and 5-year frequency for commercial/ industrial areas) drainage related Capital Improvement Projects (CIP). This 20-year old plan should be updated to include drainage, detention, groundwater and stormwater quality issues. Land use has changed significantly and the plan should consider planned development and redevelopment activities. Stormwater quality permitting requirements and BMPs should be further assessed and applied to individual sub-basins. The following issues should be considered:

- ◆ Assess current and future land use and associated imperviousness.
- ◆ Update hydrology/hydraulic models.
- ◆ Consider groundwater flows when evaluating existing capacity.
- ◆ Consider peak flows for the minor and major storm events.
- ◆ Limit the post development peak discharge rate to the pre-development discharge rate for single design two-year storm events.
- ◆ Separate stormwater drainage from the irrigation ditches.
- ◆ Focus on known problem and future development areas.
- ◆ Integrate water quality and other multi-objective issues in the updated plan.
- ◆ Re-evaluate detention including the possibility of regional detention and increasing existing detention.
- ◆ Locate (estimate) the water table throughout the City.
- ◆ Re-evaluate remaining projects for necessity and community objectives.
- ◆ Re-prioritize recommended projects.
- ◆ Review and revise the City's criteria for prioritization.

Design and Construction Standards

The City's Design and Construction Standards (DCS) regulate the design and construction of public infrastructure, improvements, and landscaping within the City's public rights-of-way and public easements. The current standards were last updated November 16, 2000, and need to be consistent with the most current

versions of the Urban Drainage and Flood Control District (UDFCD) standards. Stormwater drainage and stormwater quality standards also need to be integrated.

Maintenance

The recommended action items will address the current maintenance issues of frequency and tracking of maintenance activities.

- ◆ Integrate above grade facility information associated with the major drainageways into the City's maintenance management system.
- ◆ Integrate maintenance performed by the UDFCD into the City's maintenance management system.
- ◆ Include project management personnel in the Call-Log database.
- ◆ Inspect and remove excessive vegetation and debris along open drainageways on a yearly cycle or as needed based on requests.
- ◆ Remove debris from inlets on a 2-year cycle or as needed based on requests.
- ◆ Remove silt and sand deposits from manholes and open channels on a 2-year cycle or as needed based on requests.
- ◆ Inspect and repair storm sewer pipe on a 2-year cycle or as needed based on requests.
- ◆ Clean excessive deposits of sediment within storm sewers on a 2-year cycle or as needed based on requests.

Detention

The City has required on-site detention for new developments since the early 1970s. On-site detention storage is required for all developments other than individual single-family lots that are not part of a larger development. Most of these facilities are privately owned and maintained. The design of these facilities is reviewed by City staff at the time of application. The facilities are inspected and as-built drawings are now required to be submitted. However, there is currently no follow-up City inspection to assure these facilities are functioning as originally intended.

Recommendations for on-site detention include:

- ◆ Review each development plan to look for opportunities to increase detention greater than the minimum currently required.
- ◆ Integrate water quality BMPs into on-site detention requirements.
- ◆ The amount of detention should be based on the degree of redevelopment proposed or an incentive plan, where going above and beyond decreases fees.

Recommendations for existing detention facilities include:

- ◆ Determine if additional inspection and maintenance is needed based on the condition assessment of a random sampling of the existing facilities. On-going inspection and maintenance could be accomplished by either the City or private property owners.
- ◆ Require property owners to periodically submit an inspection report to the City once every 5 years to certify that the

detention facility is functioning as originally designed or there is a plan for improvements.

Groundwater

Groundwater and sump systems create nuisance drainage in the public rights-of-way and potential hazards due to build-up of slime and ice. Also, groundwater dewatering systems can affect local water wells and wetlands by lowering the groundwater table. Requirements for groundwater extraction and release are loosely defined in current City regulations.

The recommended action items will allow for a proactive, rather than reactive, approach to dealing with groundwater issues:

- ◆ Identify problem areas and require more precise water table information that considers seasonal fluctuations.
- ◆ If the City believes or knows of a problem area, then a mitigation plan should be required prior to permitting.
- ◆ If groundwater is not expected but is encountered during construction then a mitigation plan should be required prior to issuing the certificate of occupancy.
- ◆ Evaluate the implications of groundwater contamination and further explore existing available soils information.
- ◆ Consider groundwater discharge as part of the update to the *Stormwater Collection System Master Plan*.
- ◆ Identify problem areas and issues including the effect of groundwater dewatering on local water wells and wetlands.

- ◆ Develop mitigation options for specific problem areas based on estimates of additional groundwater flow.

PROGRAM INTEGRATION AND IMPLEMENTATION OPPORTUNITIES

The Stormwater and Flood Management Utility is part of the City's Public Works Department. The organizational structure of the Department provides both opportunities for and challenges to integrating various program interests and other multi-objectives.

Current Program Elements

The following institutional opportunities for integration are currently defined:

- ◆ Annual Budget Process
- ◆ Greenways Master Plan and Program
- ◆ Project Planning and Approval Process (PPAP)
- ◆ Community and Environmental Assessment Process (CEAP)
- ◆ Design and Construction Standards (DCS)

Recommendations

Program Integration

This master plan recommends maintaining existing coordination and integration processes. In addition to these existing processes for program integration, this master plan has identified additional opportunities for coordination:

- ◆ Board and Council Review and Discussion of CFS Utility Master Plan

- ◆ Interactive Web Site
- ◆ Stormwater Management Plan
- ◆ Major Drainageway Planning
- ◆ Design and Construction Standards
- ◆ Flood Management Program
- ◆ Greenways Program (including update to Greenways Design Guidelines)
- ◆ Boulder Valley Comprehensive Plan
- ◆ Water Quality Master Plan
- ◆ Maintenance Program
- ◆ Annual Budget Process

A significant opportunity for integration with other City objectives is the 2005 update to the Boulder Valley Comprehensive Plan. The update process will provide an opportunity to review land use and zoning designations from the perspective of flood hazard, water quality and drainage issues.

A Flood Management Program office will be established to enhance and integrate various program functions and provide a more focused point of contact for other staff and the public. This office will work closely with Planning and Development Services - Floodplain and Wetland Management, which will continue to be the focal point for interactions with the development community.

In addition it is recommended that the Greenways program be expanded to all 15 of the City's major drainageways to provide for better integration of multiple objectives.

These additional opportunities provide a way to integrate various program interests and other multi-objectives.

Program Implementation

To assure integration with various program interests and other multi-objectives the City will use a multi-disciplined approach and involve staff from appropriate workgroups.

FINANCIAL CONSIDERATIONS

The is an enterprise funded primarily by monthly utility fees. The Utility today receives annual revenues of over \$4 million that are applied to operating activities, emergency preparedness, stormwater quality, stormwater maintenance and capital improvements.

In general, existing programs are adequately funded. However, several increases to existing program funding are presented. To support these increases in funding, money will need to be reallocated from the existing budget or a rate increase will be required as follows. The following proposed financial plan will be considered as part of the City's on-going budget process.

Flood Management

It is proposed that annual funding for the on-going flood management program increased from \$100,000 to \$350,000 per year. This represents a shift to balance structural and non-structural solutions for flood management.

Stormwater Management

It is proposed that:

- ◆ A one-time additional funding allocation of \$250,000 should be

made in the 2005 budget to update the Stormwater Collection System Master Plan.

- ◆ Additional annual funding of \$50,000 should be allocated to begin an inspection and maintenance program for stormwater quality and existing private on-site detention facilities.
- ◆ Additional annual funding of \$50,000 should be allocated to GIS tools development and support.

At proposed funding levels it will take many years to achieve the goals of this master plan. The financial approach recommended in this plan considers evolving regulations, technology and development characteristics. A slower, methodical approach will allow for planning and adapting to these anticipated changes.

**CITY OF BOULDER, COLORADO
BOARDS AND COMMISSIONS MEETING SUMMARY FORM**

NAME OF BOARD/COMMISSION: Water Resources Advisory Board
DATE OF MEETING: May 17, 2004
NAME/TELEPHONE OF PERSON PREPARING SUMMARY: Robin Madel, 303-441-4073
NAMES OF MEMBERS, COUNCIL, STAFF AND INVITED GUESTS PRESENT: BOARD MEMBERS – Ken Wilson, Jim Knopf, Gil Barth, Jeannette Hillery, Bart Miller STAFF – Ned Williams, Robin Madel, Joann Roberts-Stacy, Paul Lander, Chris Rudkin, Bob Harberg, Alan Taylor, Molly Tayer (mediator), Steve Rogers (URS Consulting), Carol Linn, Joanna Crean, Andy Schultheiss. (council member)
WHAT TYPE OF MEETING (BOLD ONE) [REGULAR] [SPECIAL] [QUASI-JUDICIAL]
Agenda Item 1 – Call to Order. The meeting was called to order at 6:08 p.m.
Agenda Item 2 – Meeting Minutes Meeting minutes from April 19, 2004. <u>Ken Wilson</u> motioned to approve the minutes from April 19, 2004 as written. <u>Bart Miller</u> seconded the motion. The vote was 4-0 in favor of the motion. Gil Barth had not yet arrived.
Agenda Item 3 – General Public Participation There was none. General Public Participation was closed.
Agenda Item 4 – Staff presentation and discussion about city council/advisory board procedures. <u>Joann Roberts-Stacy</u> and <u>Andy Schultheiss</u> held a discussion about city council expectations for advisory board members and staff responsibilities to those board members. The goal of the council is to offer clarity for all parties involved in issues and to get all points of view heard.
Agenda Item 5 – Staff presentation and discussion about water conservation metrics. <u>Paul Lander</u> discussed the issue. The intention of conservation metrics is to measure the effectiveness of conservation. Lander discussed the definition of metrics, answered questions and took suggestions from the WRAB members. Public Participation <u>Chuck Howe</u> , 4875 Sioux Dr., Boulder, recommended that the city look at the cost of the program because we may be able to get water more cheaply from the Northern Colorado Water Conservancy District (NCWCD). Public Participation was closed. <u>Chris Rudkin</u> said that the staff would be doing surveys about water use to gain data for trend evaluation and to see how people are reacting to water conservation measures.
Agenda Item 6 – Public hearing and final recommendation on the Comprehensive Flood & Stormwater Masterplan update. <u>Bob Harberg</u> reviewed the participants involved in the creation of the CFS and the public participation process to date. Harberg reviewed the plan and said that the most significant outcome of the program was a budgetary increase. Bart Miller asked about opportunities for linking the CFS to the county emergency operations system. Public Participation <u>Elizabeth Black</u> , 4340 N. 14 th St., Boulder, is supportive of the plan but feels it doesn't go far enough to establish a program for clear drainage ways in the city. Black asked the WRAB to direct the city to define minimum volumes of water that can be handled by each drainage way. Black said that city opens itself to liability in the event of flood-related fatalities. <u>Sarah Michl</u> , 501 Aurora Ave., Boulder, said she is a member of the Community Review Group and she advocated spending the money to create clear drainage ways throughout the city. Michl also advocated being more aware of zoning and land use laws. Michl supported obtaining additional funding for flood-related programs and said she thinks it is crucial to have program integration and a central point of contact for emergency operations. Public Participation was closed.

Water Resources Advisory Board
Summary Minutes
May 17, 2004
Page 1

The board and staff discussed the extreme costs involved with providing clear drainage ways. The city resolves the problems as the budget allows and also encourages people who are living in floodplains to become insured and be prepared to deal with floods.

Ken Wilson motioned to approved the CFS Masterplan with the following recommendations:

- The path the city has chosen is a slower, more affordable path and there is a faster path that is a lot more expensive.
- There needs to be better coordination between departments on flood issues.

Jim Knopf seconded the motion.

The vote was 5-0 in favor of the motion.

Agenda Item 7 – Staff presentation and discussion about the 2005 budget.

Carol Linn and **Bob Harberg** reviewed the major changes to the budget since the previous month's presentation. Questions covered specific projects. The budget item will be presented in June for WRAB approval.

Agenda Item 8 – Staff presentation and discussion about the water rate structure.

Public Participation

Chuck Howe, 4875 Sioux Dr., Boulder, said that he is concerned about the recommendation from the board for a water budget because it ratifies historical decisions, especially about large lots and it isn't based on the actual cost of water. Howe said that the staff recommendation is closer to a system that would recognize the costs of raw water and he supports the staff recommendation.

Joanna Crean reviewed the status of the previous WRAB and staff recommendations. Ken Wilson and the staff have met to discuss the basis of a rate structure that might be acceptable to the WRAB and staff, as well as rate structure components that require additional information. The WRAB and staff reached agreement on several issues but still required more discussion on commercial/industrial structures and whether to use specific lot size or standard lot size for the single family residential structure. Staff will also develop a simple rate structure for city council consideration.

Agenda Item 9 – Non Agenda Items.

Matters from the Staff

Ned Williams discussed the following:

- The WRAB retreat and the expectations for the staff members. The WRAB scheduled the retreat on Monday, June 7, 6-9 p.m. at the Municipal Services Center Conference Room.
- A Community Environmental Assessment Process (CEAP) document that will be produced for the Boulder Feeder Canal and presented to the board in fall 2004.
- Lakewood Pipeline. The pipeline is operational but the hydroelectric facility hasn't been started. The Forest Service says that the city is in violation of the easement because the pipeline construction did not meet the specifications that were approved under the initial easement agreement. Additional reviews may be required. The staff will be presenting the project to the city council on July 6, 2004 and may ask the council to accept the pipeline. The old pipe will become unusable because certain sections of it will be removed.
- The water supply. The water supply is in good shape and no restrictions will be recommended for this summer.

Matters from the Board

- Jim Knopf said that the annual NCWCD tours of the Colorado-Big Thompson water system are scheduled and will occur soon.
- Ken Wilson asked to have a tour of the Silver Lake watershed this summer.
- Robin Madel asked the board members to review the Greenways material provided in the packets and forward any comments about the material to the Greenways Advisory Committee (GAC) representative, Gil Barth, before the GAC meeting on May 19, 2004.

Agenda Item 10 – Adjournment

Gil Barth motioned to adjourn the meeting.

Jim Knopf seconded the motion.

The vote was 5-0 in favor of the motion.

The meeting was adjourned at 10:02 p.m.

Date, Time, and Location of Next Meeting:

Monday, June 7, 2004, 6 p.m., WRAB retreat, at the City Municipal Services Center conference room.

Monday, June 21, 2004, 7 p.m., regular meeting, at the City Municipal Services Center conference room.

MINUTES NOT YET APPROVED BY THE WRAB

Minutes approved by _____

Date _____

ATTACHMENT C

Independent Review Panel Final Report from Flood Management Review Process

April 2, 2004

Dear Mayor Toor and Members of the Boulder City Council:

We are writing today to provide a brief overview of the work of a dedicated set of volunteers who have been in-service to the city of Boulder since 1999, and to provide a recommendation for what we hope will become an operating standard in floodplain master planning and management for the future of Boulder.

In December 1999, Brian Hyde, Mary Fran Myers, Gilbert White, and Ken Wright were appointed to an Independent Review Panel (IRP) to provide oversight and advice on the restudy of the Fourmile Canyon/Wonderland Creek floodplain when the city discovered discrepancies in the existing floodplain mapping, and consequent community-confidence challenges were raised by the citizens living in that corridor. Since then we have provided similar assistance on the restudy of South Boulder Creek and the Comprehensive Flood and Stormwater Master Plan update. During the past five years, we have been joined by other scientists and experts as necessary, including: Dr. Bill Bradley and Dr. Rich Madole, who sat with us in the first two years as we reviewed the alluvial geology for the Fourmile-Wonderland formation. Dr. Jonathon Freidman provided invaluable assistance in reviewing the paleohydrology for South Boulder Creek. Most recently, UDFCD Executive Director Scott Tucker joined the IRP in the review of the Comprehensive Flood and Stormwater (CFS) master plan update.

During this period there have also been national reviews of a number of public flood management policies that are relevant to the Boulder area. For example, the Federal policy with respect to defining property subject to possible 100-year flooding and mandatory Federal flood insurance has been subject to critical evaluation. In recent years, the estimated national annual losses from floods outside the mapped 100-year floodplain have been larger than losses from within the 100-year flood zone, and there are questions as to whether or not the frequency adopted in the national insurance program has increased vulnerability to flood losses. Within the city of Boulder, for example, there are nearly 5300 properties known to be subject to the 500-year flood event.

We have truly enjoyed the opportunity to serve the city of Boulder. As the draft Comprehensive Flood and Stormwater drainage Master Plan moves into the board review process, we feel that we have met our obligations as an independent panel and it is time that we disband as a review group. However, please know that while we will no longer be sitting together as the "IRP," we do wish to be called upon in the event that the City Council has new questions or issues for which we can be of assistance.

We want to leave our work with a summary statement which we recommend guide the future of Boulder's floodplain management practice.

In our 2001 Fourmile Canyon Creek Phase A Report recommendation, we provided a set of directions for staff to include in the Phase B scoping effort. In its most basic form, our recommendation, which is applicable to each of Boulder's 13 creeks/tributaries, suggests that the city of Boulder adopt flood management practices that consider the specific geology, challenges of adjacent development and anticipated flooding for each reach of each stream, and that the full array of non-structural mitigation tools (e.g., education and training, warning devices, and individual property flood-proofing) be given equal weight and consideration to structural applications (e.g., engineered flood-management installations, widened and channelized creeks, dams and floodwalls) so that situation-specific mitigation may be identified and designed to best fit each case.

Thus, we ask that the City Council acknowledge the contribution of five years of professional expertise and opinion by requesting the City Manager to assemble a flood risk management program that gives equal weight to non-structural and structural options and that is tailored to address the needs and resources identified in each particular floodplain.

We also remind the city of the role that citizen education will have in the formulation of the above-described tailored floodplain management system. Boulder must provide comprehensive flood protection education so that our residents can meaningfully participate in the formation of alternatives for their watershed.

Actions which citizens of Boulder should take in response to flood hazards include the following:

- 1) Effective emergency action every occupant in a floodplain should take, or NOT take, to reduce damages to life and property in the event a public flood warning is issued;
- 2) What action every property occupant in a floodplain could take in advance of a flood to prevent or reduce losses before a flood occurs;
- 3) The effect of non-development in the floodplain on potential flood losses;
- 4) How to implement flood proofing measures;
- 5) Advantages of; and how to acquire flood insurance.

Again, we want to thank you for involving us in this important work. We have enjoyed the opportunity to serve our community and work on these critical projects.

Members of the IRP since 1999 and for the 2003-2004 CFS Review:

Brian Hyde

Mary Fran Myers

Gilbert White

Ken Wright

L. Scott Tucker

ATTACHMENT D

City of Boulder
Comprehensive Flood and Stormwater (CFS)
Utility Master Plan
April 2004 Draft
PLAN Boulder County
Summary of Comments and Responses

June 22, 2004

PLAN-Boulder County urges you to support the draft Comprehensive Flood and Stormwater Utility Master Plan. Among other useful recommendations, it outlines valuable guiding principles for flood and stormwater management and recommends a balanced approach between structural and non-structural options, recognizing the vital role of community education. Notably, it also recognizes the importance of addressing floods greater than 100-year floods by recommending 500-year flood protection for critical facilities.

We recommend three additions to the draft Master Plan:

1. The City should identify a flood management point person (manager, coordinator, ombudsman, etc.) and establish a set location where the public can contact the floodplain management office. Consolidation of the flood management function is necessary to enhance the city's ability to coordinate its flood management responsibilities and to provide a single point of public contact. This flood management point person or persons should have authority to make decisions and be able to draw on resources scattered throughout City departments. The floodplain management office also should be charged with the responsibility of maintaining accurate maps for the 100 and 500-year floodplains.

Response: Utilities Project Manager, Alan Taylor, has been assigned to manage the City's flood management program as outlined in the CFS Utility Master Plan. As the new "flood management program manager," Mr. Taylor will be responsible for facilitating coordination between flood management activities that occur in various work groups that support the Storm Water and Flood Management Utility, including Planning and Development Services, Utilities Maintenance, Storm Water Quality and Utilities Project Management. The flood management program manager will also serve as the point of contact on city-wide flood management issues, such as floodplain mapping and risk assessment studies, floodplain management and mitigation planning, coordinating local responsibilities for the National Flood Insurance Program and Community Rating System, emergency preparedness, and general flood management program operations.

The City is also implementing measures to better establish an improved identify for and access to the flood management program. This effort will clarify public contact

points and locations for various flood management resources such as floodplain mapping information, floodplain development regulation, flood preparedness and education materials, flood insurance information and local efforts in flood management and mitigation. In order to fully serve the public on flood related matters, the City intends to establish user friendly resources that are publicly accessible by telephone, the Internet, regular mail and walk-in customer service at the City office on the 2nd floor of the Park Central Building (1739 Broadway).

2. The city should examine whether upgrading our existing regulations to provide 500-year flood protection for all development is a viable course for the city to pursue. We know that greater than 100-year floods will occur. The energy and money we should spend on preparing for them ahead of time through regulation and public education are small compared to the human and material costs of not doing so once a big flood occurs. We urge that this new Master Plan commit the city to exploring this alternative.

Response: CFS proposes that the flood management program evaluate the effectiveness of the 100-year storm event as the basis for established floodplain regulations. The analysis would be performed subsequent to the adoption of CFS and would provide for a separate public involvement process. It is intended the analysis would address factors including the risk of larger floods and their impact on the community, the uncertainty associated with establishing a regulatory boundary given continued encroachments from allowed development in the floodplain and the emerging statistics that indicate 30-50 percent of flood damages in the United States are occurring in areas outside the 100-year floodplain.

The flood management program plans to perform an analysis of flood hazards and impacts in the 100-year with respect to local land use and development policies. The results are expected to provide an overview and basis for evaluating the effectiveness of flood hazard reduction policies balanced with local land use policies addressing community development and vitality. A component of this analysis involves the definition and protection of critical facilities for 500-year flooding events (as applied to the recent development of the Boulder Foothills Community Hospital).

3. Finally, before this Master Plan goes to City Council for adoption, there should be a more clearly articulated fiscal component, so that the budgetary implications of the Master Plan are acknowledged.

Response: Additional information concerning financial considerations has been added to Chapter 7.

2004 COUNCIL GOALS:

- 1) Community Sustainability**
- 2) Economic Sustainability:**
- 3) Environmental Sustainability:**
- 4) Transportation:**
- 5) Affordable Housing:**

LEAD COUNCILMEMBERS:

**Robin Bohannon, Crystal Gray,
Shaun McGrath and Andy Schultheiss
Shaun McGrath, Gordon Riggle and
Mark Ruzzin
Tom Eldridge and Mark Ruzzin
Andy Schultheiss and Jack Stoakes
Robin Bohannon and Tom Eldridge**

REGIONAL ORGANIZATIONS:

**Boulder County Consortium of Cities:
Boulder County Regional Transit Committee:
Boulder Valley School District Issues:
Colorado Municipal League (CML):
Denver Regional Council of Governments (DRCOG):
Metro Mayors Caucus:
Resource Conservation Advisory Board:
Rocky Flats Coalition of Local Governments:
Transit Alliance:
Univers-City Issues:
US 36 Mayors and Commission Coalition:**

**Mark Ruzzin, alternate Tom Eldridge
Will Toor, alternate Jack Stoakes
Crystal Gray and Andy Schultheiss
Shaun McGrath, alternate Frank Bruno
Will Toor, alternate Jack Stoakes
Mark Ruzzin, alternate Tom Eldridge
Lisa Morzel, alternate Crystal Gray
Shaun McGrath, alternate Alice Guthrie
Jack Stoakes, alternate Tracy Winfree
Tom Eldridge, Crystal Gray, Gordon Riggle, Mark Ruzzin
Will Toor, alternate Jack Stoakes**

REGIONAL STUDIES:

**North Front Range EIS:
Northwest Metro EIS:
US 36 EIS:
Diagonal Corridor Transit Study:**

**Tom Eldridge, alternate Tracy Winfree
Andy Schultheiss, alternate Tracy Winfree
Will Toor, alternate Shaun McGrath
Tom Eldridge, alternate Will Toor**

LOCAL ORGANIZATIONS:

**Boulder Museum of Contemporary Art (BMoCA):
Boulder Convention and Visitors Bureau:
Dairy Center for the Arts:
Downtown Business Improvement District Board:
Housing Authority:**

**Crystal Gray
Gordon Riggle, alternate Jack Stoakes
Robin Bohannon, alternate Jack Stoakes
Mark Ruzzin and Andy Schultheiss
Robin Bohannon**

INTERNAL CITY COMMITTEES:

**Audit Committee:
Budget Committee:
Charter Committee:
Evaluation Coordinators:
Technology:
Valmont Butte:
Civic Use/9th & Canyon**

**Gordon Riggle and Mark Ruzzin
Tom Eldridge, Crystal Gray, Jack Stoakes
Tom Eldridge, Shaun McGrath, Andy Schultheiss
Robin Bohannon and Gordon Riggle
Gordon Riggle and Mark Ruzzin
Tom Eldridge and Crystal Gray
Crystal Gray and Jack Stoakes**

SISTER CITY REPRESENTATIVES:

**Jalapa, Nicaragua:
Llaza:, Tibet
Dushanbe, Tajikistan:
Yamagata, Japan:
Mante, Mexico:
Yateras, Cuba:**

**Shaun McGrath
Robin Bohannon
Jack Stoakes
Mark Ruzzin
Tom Eldridge
Crystal Gray**